NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
FACT SHEET

Permittee and Mailing Address:	Guam Waterworks Authority P.O. Box 3010 Agana, Guam 96910
Permitted Facility and Address:	Umatac-Merizo Wastewater Treatment Plant Route 2 Merizo Merizo, Guam 96915
Contact Person:	Mr. John Benavente Interim General Manager P.O. Box 3010 Hagatna, Guam 96910 (671) 647-2600
NPDES Permit No.:	GU0020273

PART I - STATUS OF PERMIT

Guam Waterworks Authority (hereinafter, the "permittee") has applied for renewal of its National Pollutant Discharge Elimination System (NPDES) permit pursuant to U.S. Environmental Protection Agency (EPA) regulations set forth in Title 40, Code of Federal Regulations (CFR), Part 122.21, for the discharge of treated effluent from its Umatac-Merizo Wastewater Treatment Plant (Umatac-Merizo WWTP) to the Toguan River, tributary to Toguan Bay of the Philippine Sea, Pacific Ocean. These regulations require any person who discharges or proposes to discharge pollutants from a point source into waters of the U.S. to submit a complete application for a NPDES permit, including renewal of a permit. Because the Territory of Guam (Guam) has not been delegated primary regulatory responsibility for administering the NPDES program, EPA is issuing a NPDES permit which incorporates both federal CWA and Guam water quality requirements. In accordance with 40 CFR 122.21(e), on June 21, 2006 the permittee submitted a complete application for renewal of its NPDES permit. The permittee is currently discharging to the Toguan River under the NPDES Permit No. GU0020273, which became effective on September 7, 2000 and expired on September 6, 2005. Pursuant to 40 CFR 122.21, the terms of the existing permit are administratively extended until the issuance of a new permit.

PART II - DESCRIPTION OF FACILITY

The permittee owns and operates a waste water treatment facility (the "facility") that is located in the town of Merizo, on the Island of Guam (Attachment A). The facility discharges treated domestic wastewater from the Umatac-Merizo WWTP to the Toguan River. The WWTP outfall discharges within territorial waters of Guam.

The Umatac-Merizo WWTP was built in 1981 and is a Class II wastewater treatment plant as defined under GEPA Water and Waste Water Regulations. The facility was designed to serve a population of approximately 4,000. Attachment B provides a flow diagram of the general

wastewater treatment process flow stream. The facility has a Waste Stabilization Pond Treatment System (a mechanically aerated, facultative treatment lagoon) and Wetlands Treatment System (WTS). Flow through the WTS is shown in Attachment C. The WTS became operational in 1996 and consists of six associated constructed wetland ponds where evapotranspiration and percolation "polish" effluent from the aerated treatment lagoon to reduce nutrient levels prior to discharge. The facility does not chlorinate or otherwise disinfect the effluent. The following process data are provided in the October 2006 Guam Water Resources Master Plan (the "Master Plan"):

Liquids Treatment

- Flow enters the influent pump station by gravity through a Parshall flume and is pumped to the aerobic facultative lagoon;
- Influent entering the lagoon displaces treated effluent that flows to the effluent pump station, which sends the treated effluent to the constructed WTS located about a mile distant;
- The WTS consists of two parallel terraced grass fields and a distribution valve piping system so that the disposal fields can be alternated;
- Treatment occurs through evapotranspiration and percolation as the effluent flows through the field;
- Remaining effluent is collected at a concrete interceptor ditch, pumped back to a recirculation pond, and then pumped to the head of the WTS for recirculation through the WTS;
- If the recirculation pond overfills, it overflows into a concrete spillway that conveys to the Toguan River and is the permitted discharge covered under a NPDES permit; and

Solids Treatment

- Sludge accumulation from the bottom of the aerated facultative lagoon is dredged when necessary. The only recorded dredging was 40,000 gallons of sludge removed in 1992.

According to the Master Plan, although the facility applied for and received an NPDES permit based on its treatment system and discharge design, the facility has been and is currently operated on a zero discharge scheme accomplished through evapotranspiration and percolation from the wetland ponds. The Master Plan indicated that information submitted in quarterly operations & maintenance reports indicate there were accidental discharges for a week in February and from October 20th to 22nd in 2004. However, the Master Plan also stated there were no discharges according to Discharge Monitoring Reports (DMRs) from January 2004 to March of 2005, which includes this period. EPA's review of DMRs from 2002 to September 2007 did not find any discharges reported for February or October of 2004, although a discharge was reported for November 2004. Discharges were reported for January through November 2002 but no discharges other than November 2004 were reported for 2003[1] through September

[1] DMRs reviewed for 2003 included those for January, February, March, June, July, August, and September.

2007. The application for permit renewal indicates that the facility is an intermittent discharger, with an estimated 30 discharges annually during the months of June, July, and August. This estimate would appear high based on historical data.

PART III - DESCRIPTION OF DISCHARGE AND RECEIVING WATER

During facility operations, the permittee discharges to the Toguan River at the following discharge point:

Discharge Point No.	Discharge Point Description	Effluent Description	Discharge Point Latitude	Discharge Point Longitude
001	Outfall from the Umatac-Merizo WWTP	Secondary Treated Wastewater (Non-disinfected)	13° 17’ 02” N	144° 40’ 00” E

Discharge Point No. 001 is located approximately 1,100 feet upstream of the Toguan Bay estuary. Secondary effluent from the WWTP outfall is discharged to Category S-3 (Low) receiving waters of Toguan River.

The effluent discharged at Discharge Point No. 001 from the WWTP consists of treated sanitary wastewater that is regulated under an existing NPDES permit. Based on the application, the design flow for the facility is 0.391 million gallons per day (MGD). In DMRs submitted by the facility for 2002 through 2007, the permittee reported a maximum daily maximum flow rate of 1.5 MGD (February 2002) and a maximum monthly average flow of 0.489 MGD (July 2002). Table 1 provides a summary of effluent limitations and discharge monitoring data (January 2002 to December 2004). No discharges were reported from January 2005 through September 2007. Based on limited effluent monitoring data, elevated temperature and concentrations of biological oxygen demand, total suspended solids, orthophosphate, nitrate nitrogen, and ammonia nitrogen have been observed. As of the date of issuance of the final permit, there will be a Stipulated Order between the permittee and EPA to address ongoing compliance issues at all of the permitee's POTWs.

To protect the designated uses of waters of the U.S., Guam has adopted water quality standards for surface freshwater depending on the level of protection required. The Toguan River is a territorial water of Guam and is classified as a freshwater tributary to the Philippine Sea. The Toguan River at the WWTP outfall is considered category S-3 low quality surface water. The Guam Water Quality Standards (GWQS) identify the protected uses for category S-3 waters to include the following:

- aesthetic enjoyment;
- commercial, agricultural, and industrial activities;
- limited body-contact recreation; and
- maintenance of aquatic life.

Table 1 – Summary of Existing Effluent Limitations and Discharge Monitoring Data from January 2002 to December 2004 for Discharge Point No. 001 for the Umatac-Merizo WWTP. No discharges were reported for January 2005 to December 2007.

Parameter	Units[1]	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Type
Flow Rate	MGD	Monitoring Only	Monitoring Only	Monitoring Only	0.489	--[2]	1.50	Continuous	Continuous
Biochemical Oxygen Demand (5-day)	mg/L	30	45	--	87	87	--	Weekly	24 hr Composite
	lbs/day	98	150	--	311	311	--		
	Percent Removal	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period (85 percent BOD removal)			37-84 (min-max)	--	--		
Total Suspended Solids	mg/L	30	40	--	84	84	--	Weekly	24 hr Composite
	lbs/day	98	130	--	301	301	--		
	Percent Removal	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period (85 percent removal)			--	--	--		

Table 1 Continued – Summary of Existing Effluent Limitations and Discharge Monitoring Data from January 2002 to December 2004 for Discharge Point No. 001 for the Umatac-Merizo WWTP. No discharges were reported for January 2005 to December 2007.

Parameter	Units[1]	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Type
Dissolved Oxygen	mg/L	Monitoring Only	--	Monitoring Only	1.1 (minimum)	--	3.0 (minimum)	Weekly	Discrete
Temperature	°C	Monitoring Only	--	Monitoring Only	19.1 (minimum)	--	-28.0	Weekly	Discrete
pH	Standard Units	Not < 6.5 nor > 8.5 SU at any time			7.05 (minimum)	--	8.75	Weekly	Discrete
Turbidity	NTU[3]	--	--	1.0	3.7	--	30.3	Weekly	Discrete
E. coli[4]	CFU/ 100 mL	126	--	406	--	--	24,192	Weekly	Discrete
Enterococci	CFU/ 100 mL	Monitoring Only	--	--	--	--	140,800	Weekly	Discrete
Total Chlorine Residual[5]	µg/L	6.1	--	12	--	--	--	Weekly	Discrete
	lbs/day	0.020	--	0.039	--	--	--		
Ortho-phosphate (PO_4P)	mg/L	Monitoring Only	--	0.10	0.690	--	0.690	Weekly	24-hr Composite
	lbs/day	Monitoring Only	--	0.33	2.48	--	3.06		
Total Kjedahl Nitrogen	mg/L	Monitoring Only	--	Monitoring Only	-	--	--	Weekly	24-hr Composite

Table 1 Continued – Summary of Existing Effluent Limitations and Discharge Monitoring Data from January 2002 to December 2004 for Discharge Point No. 001 for the Umatac-Merizo WWTP. No discharges were reported for January 2005 to December 2007.

Parameter	Units[1]	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Type
Nitrate-Nitrogen (NO_3-P)	mg/L	Monitoring Only	--	0.50	0.48	--	1.27	Weekly	24-hr Composite
	lbs/day	Monitoring Only	--	1.6	2.48	--	3.06		
Ammonia-Nitrogen	mg/L	Monitoring Only	--	Monitoring Only	7.64	--	10.6	Weekly	24 hr Composite
Heavy Metals[6]	µg/L or mg/L	Monitoring Only	--	Monitoring Only	--	--	--	Annually	24-hr Composite
Hardness as $CaCO_3$	mg/L	Monitoring Only	--	Monitoring Only	--	--	--	Annually	24-hr Composite
Pesticides[7]	µg/L or mg/L	Monitoring Only	--	Monitoring Only	--	--	--	Annually	24-hr Composite
Oil and Grease	mg/L	Monitoring Only	--	Monitoring Only	--	--	--	Annually	Discrete
Whole Effluent Toxicity	TU_C	Monitoring Only	--	Monitoring Only	--	--	--	Annually	24-hr Composite

[1] Mass limitations based on an annual average daily design flow of 0.391 MGD
[2] Not applicable or no data available
[3] Nephelometric Units
[4] To determine compliance, a minimum of four (4) samples must be collected at approximately equal intervals; reported as colony forming units (CFU) per 100 mL
[5] Contact time following chlorination and prior to effluent discharge shall not be less than 15 minutes
[6] Heavy metals include: As, Cd, Cr^{3+}, Cr^{6+}, Cu, Pb, Hg, Ni, Ag, and Zn, and shall be monitored for both total recoverable and dissolved metal
[7] For the listing of all pesticides (organochlorines, organophosphates, carbamates, herbicides, fungicides, defoliants, and botanicals) see EPA Water Quality Criteria *Blue Book*

PART IV - DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires point source dischargers to control the amount of pollutants that are discharged to waters of the U.S. The control of pollutants is established through effluent limitations and other requirements in NPDES permits. When determining effluent limitations, EPA must consider limitations based on the technology used to treat the pollutant(s) (i.e., technology-based effluent limits) and limitations that are protective of water quality standards (i.e., water quality-based effluent limits).

A. Applicable Technology-Based Effluent Limitations

EPA developed technology-based treatment standards for municipal wastewater treatment plants in accordance with Section 301(b)(1)(B) of the CWA. The minimum levels of effluent quality attainable by secondary treatment for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and pH, as defined in 40 CFR 133.102, are:

- BOD: 30 mg/L as a 30-day (monthly) average,
  45 mg/L as a 7-day (weekly) average, and
  85% removal efficiency;

- TSS: 30 mg/L as a 30-day (monthly) average,
  45 mg/L as a 7-day (weekly) average, and
  85% removal efficiency; and

- pH: Must range from 6.0 – 9.0 standard units as an instantaneous maximum.

In accordance with 40 CFR 133, technology-based effluent limitations are proposed for BOD, TSS, and pH based on secondary treatment requirements for municipal wastewater treatment facilities. These requirements are performance-based and represent the degree of effluent reduction achievable using available wastewater treatment technology. In conjunction with federal requirements, Section 5104 of GWQS provides secondary treatment requirements that describe the minimum level of effluent quality to be attained when secondary treatment is required. Table 2 provides a summary of proposed technology-based effluent limitations for Discharge Point No. 001.

1. **Biochemical Oxygen Demand.** Pursuant to 40 CFR 133.102 and GWQS Section 5104(A)(7)(a), effluent limitations are proposed for BOD. Secondary treatment requirements provide that effluent concentrations of BOD shall not exceed 30 mg/L on a 30-day average and not exceed 45 mg/L based on a 7-day average. In addition, the 30-day average percent removal shall not be less than 85 percent. Therefore, EPA proposes an average monthly limitation of 30 mg/L and average weekly limitation of 45 mg/l; and that the 30-day average percent BOD removal shall not be less than 85 percent. Based on the facility's design flow of 0.391 MGD, EPA also proposes a mass-based an average monthly effluent limitation of 98 lbs/day and an average weekly effluent limitation of 150 lbs/day for BOD.

Table 2 - Summary of Proposed Technology-Based Effluent Limitations for Discharge Point No. 001 for the Umatac-Merizo WWTP.

Parameter	Units[1]	Proposed Technology-Based Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Biochemical Oxygen Demand (5-day)	mg/L	30	45	--	--	--
	lbs/day	98	147	--	--	--
	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.					
Total Suspended Solids	mg/L	30	45	--	--	--
	lbs/day	98	147	--	--	--
	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.					
Fecal Coliform	CFU/ 100 mL	200	400	--	--	--
pH	Standard Units	--	--	--	6.5	8.5
Oil and Grease	mg/L	10	--	15	--	--
	lbs/day	33	--	49	--	--

[1]Mass-based limits based on annual average daily design flow of 0.391 MGD

2. **Total Suspended Solids.** Pursuant to 40 CFR 133.102 and GWQS Section 5104 (A)(7)(b), effluent limitations are proposed for TSS. Secondary treatment requirements provide that effluent concentrations of TSS shall not exceed 30 mg/L on a 30-day average and 45 mg/L on 7-day average. In addition, the 30-day average percent removal shall not be less than 85 percent. Therefore, EPA proposes an average monthly effluent limitation of 30 mg/L and an average weekly effluent limitation of 45 mg/L. Based on the facility's design flow of 0.391 MGD, EPA also proposes a mass-based average monthly effluent limitation of 98 lbs/day and average weekly effluent limitation of 147 lbs/day for TSS.

3. **Fecal Coliform**. GWQS Section 5104 (A)(7)(c) provides secondary treatment requirements for bacteria. GWQS provide that the arithmetic mean of the fecal coliform values for effluent samples collected over a period of 30 consecutive days shall not exceed 200 colony forming units (CFU) per 100 mL, and the arithmetic mean values for the effluent samples collected over a period of seven consecutive

days shall not exceed 400 CFU per 100 mL. In addition to these technology-based standards, GWQS also provide receiving water standards for bacteria based on E. coli and enterococci for S-3 waters. Fecal coliform, E. coli, and enterococci are all used as indicators to estimate the presence of pathogens. The existing permit established effluent limits for bacteria based on E. coli and enterococcus. (See Section IV.B.3.f and IV.B.3.g for the discussion of water-quality-based microbiological permit limits). Currently, the facility does not have the infrastructure necessary to disinfect its wastewater and there are no plans to construct a disinfection system in the near future. However, because fecal coliform standards are performance-based requirements for secondary treatment facilities and should the facility establish a disinfection system during the permit term, EPA proposes effluent limitations for fecal coliform in the draft permit as an indicator to determine the effectiveness of the facility's disinfection system. Fecal coliform limits shall be immediately effective upon operation of a disinfection system.

4. **pH.** 40 CFR 133.102(c) and GWQS Section 5104 (A)(7)(d) provide secondary treatment requirements for pH that state effluent values for pH shall be maintained within the limits of 6.0 and 9.0 standard units. The existing permit established pH effluent limits between 6.5 to 8.5 standard units, which are more stringent than the required treatment performance standard or the water quality criterion for Toguan River. Sections 5103(C)(2) and 5104(A)(7)(d) of the GWQS provide that the pH for category S-3 waters of the Toguan River shall be between 6.5 to 9.0. Federal regulation required that when establishing effluent limitations, the more stringent of the technology and water-quality based limitations applies. Based on effluent monitoring data, pH values ranged between 7.05 and 8.75 standard units, with two excursions above 8.5 standard units out of 22 sampling measurements. Therefore, since the facility has been performing at the required level established in the existing permit, EPA proposes to retain the existing pH limitation in the draft permit that the pH level of the effluent shall be not less than 6.5 or greater than 8.5 standard units in the draft permit.

5. **Oil and Grease.** Oil and grease are common components of domestic wastewater. Section 5103 of GWQS provides narrative water quality standards that state that all waters shall be free from substances, conditions or combinations attributable to domestic discharges that cause visible floating materials, debris, oils, grease, scum, foam or other floating matter which degrade water quality or use. However, GWQS do not provide a numeric water quality standard for oil and grease. Therefore, EPA proposes effluent limitations for oil and grease based on EPA's Best Professional Judgment (BPJ) related to the development of technology-based effluent limits since (1) there are no applicable effluent limitation guidelines and performance standards for oil and grease, and (2) similar domestic wastewater treatment facilities have shown that a maximum daily limit of 15 mg/l and an average monthly limit of 10 mg/l can be easily achieved. Section 402(a)(1) of the CWA provides for the establishment of BPJ-based effluent limits when effluent limitation guidelines and performance standards are not available for a pollutant of concern. EPA proposes a maximum daily limitation of 15 mg/l and an average monthly limitation of 10 mg/L for oil and grease. These limits are consistent with similar facilities that treat

domestic wastewater in EPA Region IX. Also, based on a design flow of 0.391 MGD, EPA proposes mass-based maximum daily limitation and average monthly limitation of 49 and 33 lbs/day, respectively. In addition to the technology-based effluent limits, narrative water quality-based limits for oil and grease (GWQS Section 5103.C.10), such as prohibiting visible sheening, are proposed in the draft permit.

6. **Compliance with Federal Anti-Backsliding Regulations and Guam's Antidegradation Policy for Proposed Technology-based Effluent Limitations.** Section 402(o) of the CWA prohibits the renewal or reissuance of an existing NPDES permit that contains technology-based effluent limits that are less stringent than those established in the previous permit, except as provided in 40 CFR 122.44(l). This is referred to as "anti-backsliding." The draft permit establishes technology-based effluent limitations for BOD, TSS, and pH that are as stringent as or more stringent than those in the existing permit; therefore, anti-backsliding regulations do not apply. Also, the design flow of this facility is not increased, thus anti-degradation regulations do not apply.

B. Water Quality-Based Effluent Limitations (WQBELs)

Pursuant to 40 CFR 122.44(d)(1), water quality-based effluent limitations, or WQBELS, are required in NPDES permits when the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to an excursion above any water quality standard. Applicable water quality standards are established in GWQS, which incorporated section 304(a) federal water quality criteria. Revisions to these standards were adopted by the Guam Environmental Protection Agency (GEPA) on May 17, 2002. These standards were subsequently approved by EPA.

1. **Determining the Need for WQBELs**. When determining whether an effluent discharge causes, has the reasonable potential to cause, or contributes to an excursion above narrative or numeric criteria within State (or Territory) water quality standards, the permitting authority uses procedures which account for existing controls on point and nonpoint sources of pollution, and the variability of the pollutant or parameter in the effluent, the sensitivity of species to toxicity testing, and, where appropriate, dilution of the effluent in the receiving water. EPA conducted a Reasonable Potential Analysis (RPA) for each monitored pollutant or parameter in the effluent, except pH. The RPA was based on procedures outlined in EPA's *Technical Support Document for Water Quality-based Toxics Control* (March 1991), herein after referred to as the TSD. These procedures result in the determination of the maximum daily effluent concentration (MEC) that is determined from monitoring data provided by the permittee.

Table 3 – Summary of Reasonable Potential Analysis for Discharge Point No. 001 for the Umatac-Merizo WWTP.

Parameter	Units	Max. Effluent Concentration	*N*	Water Quality Standard	Exceeds Standard?
Orthophosphate	mg/L	0.69	10	0.10	Y
Nitrate-nitrogen	mg/L	1.27	10	0.50	Y
Ammonia Nitrogen – Acute	mg/L	10.6	10	2.01	Y
Ammonia Nitrogen – Chronic	mg/L	7.6	10	0.37	Y

Section 5104(C), (D), and (E) of the GWQS provide for the application of alternate standards within an area surrounding the discharge point, or zone of mixing, when it is not feasible to achieve an effluent quality that meets water quality standards at the point of discharge (i.e., end of the pipe). GEPA has not approved the use of dilution credits for specific pollutants in this discharge, thus for conducting RPAs, dilution credits or mixing zones were not considered. EPA reviewed DMRs submitted by the permittee for 2002 through September 2007 and identified MECs. MECs are then compared directly to the applicable water quality standard or criterion. If the MEC is greater than the applicable standard or criterion, the pollutant has a reasonable potential for violating its water quality standard or criterion. Table 1 provided DMR data for orthophosphate, nitrate-nitrogen, ammonia nitrogen, and TSS that were used in the RPA. Table 3 provides a detailed RPA for each pollutant or parameter that causes, has the reasonable potential to cause, or contributes to an excursion above GWQS. Analytical data on heavy metals and pesticides are not available to perform an RPA for these parameters.

a. Orthophosphate. Section 5103(C)(3)(a) of the GWQS provide that ortho-phosphate shall not exceed 0.10 mg/L (as P) in S-3 category surface waters. Based on DMR data, the MEC is 0.69 mg/L (November, 2004) for orthophosphate. Since the MEC is greater than the water quality criterion of 0.10 mg/L, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for orthophosphate.

b. Nitrate-nitrogen. Section 5103(C)(3)(b) of the GWQS provide that nitrate-nitrogen shall not exceed 0.50 mg/L (as N) in S-3 category surface waters. Based on DMR data, the MEC is 1.27 mg/L (November, 2002) for nitrate-nitrogen. Since the MEC is greater than the water quality criterion for nitrate-nitrogen, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for nitrate-nitrogen.

c. Ammonia Nitrogen. Treated domestic wastewater may contain levels of ammonia that are toxic to aquatic organisms. Section 5103(C)(3)(c) of the GWQS

provide that ammonia nitrogen shall be limited for S-3 category surface waters on a one-hour average (Criterion Maximum Concentration, CMC) and monthly average (Criterion Chronic Concentration, CCC) basis. These water quality criteria are pH-dependent for freshwater. To derive these criteria, the highest effluent pH reported by the facility (in the case of ammonia, the most conservative value), pH 8.75, was used. The derivations are:

CMC = {0.411 / [1 + 10^(7.204 – pH)]} + 58.4 / [(1 + 10^pH – 7.204)]

CCC = {0.0858 / [1 + 10^(7.688 – pH)]} + 3.7 / [(1 + 10^pH – 7.688)]

At pH 8.75, the CMC is 2.01 mg/L and the CCC is 0.37 mg/L. GWQS specify the 30-day average ambient concentration should not exceed the CCC; the ambient concentration averaged over four days should not exceed twice the CCC; the averaging period for the CMC is one hour.

Based on DMR data, the daily maximum MEC was 10.6 mg/L (January, 2002) for ammonia nitrogen. Based on average monthly concentrations, the MEC was 7.6 mg/L (November, 2004). Since both MECs are greater than their respective water quality criterion, EPA has determined that the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for ammonia nitrogen.

d. Total Chlorine Residual. Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Chlorine is known to be toxic to aquatic life. The existing permit established effluent limitations for total chlorine residual. The permittee does not currently have the capability to operate a disinfection system that would use chlorine. However, in the event that the facility should establish a disinfection system using chlorine, EPA has determined that the discharge would have a reasonable potential to cause, or contributes to an exceedance of GWQS for chlorine. Further, because of the absence of chlorination, microbiological limits have been included in the draft permit (see Section IV.B.3.f and IV.B.3.g for a discussion of microbiological limits).

e. Whole Effluent Toxicity. Pursuant to 40 CFR 122.2, whole effluent toxicity (WET) is defined as the aggregate toxic effect of an effluent measured directly by a toxicity test. Two types of WET tests are acute and chronic. An acute test is conducted over a shorter time period and measures mortality. A chronic test measures sublethal effects (e.g., reproduction and/or growth). GWQS provide narrative water quality criteria prohibiting discharges that "…injure or are toxic or harmful to humans, animals, plants, or aquatic life" (Section 5103(A)(1)(d) of GWQS). GWQS Sections 5103(C)(11)(A)(i) through (C)(11)(A)(iv) address general requirements for toxic substances. These requirements are often referred to as "no toxics in toxic amounts." The existing permit requires annual chronic toxicity testing using the water flea, *Ceriodaphnia dubia.* However, there are no available WET data to assess reasonable potential. Should WET data become available during the permit term, EPA will assess WET data to determine whether the discharge has a reasonable potential to cause, or contributes to an exceedance

of GWQS for toxicity (see Reopener Provisions in PART VII - SPECIAL CONDITIONS in the draft permit).

2. **Application of Mixing Zones and Dilution Credits**. The CWA directs States (and Territories) to adopt water quality standards which include the designation of uses and criteria to protect those uses. Pursuant to 40 CFR 131.13, States (and Territories) also are authorized to adopt general policies, such as mixing zones, to implement State water quality standards. Section 5103(C), (D), and (E) of GWQS allow the use of mixing zones for dischargers that would otherwise exceed water quality criteria for aquatic life, human health, and other water quality criteria at the point of discharge (i.e., end of the pipe).

    - Zones of mixing are granted by the GEPA upon review and approval of an Environmental Impact Statement and concurrence of EPA.
    - The zone of mixing shall be limited to an area that will minimize impacts on uses, and where allowed, will not adversely affect the receiving water's designated uses.
    - Water quality limits will be established if effluent limitations are revised within the mixing zone.
    - Water quality standards must be met at every point outside the zone of mixing.
    - Mixing zones are not allowed in usage categories M-1 and S-1.
    - Zones of passage must be allowed, and mixing zones must not encroach upon areas used for fish harvesting, particularly of stationary species.
    - Biologically important areas and habitat for endangered and threatened species must be protected.
    - Mixing zones shall not cause lethal conditions to aquatic life and wildlife passing through the zone or be injurious to human health from temporary exposure.

    GEPA has not approved a mixing zone for discharges from this facility. Therefore, EPA has not considered any mixing zone dilution or credit when establishing WQBELs.

3. **Establishing WQBELs**. In accordance with 40 CFR 122.44(d), the draft permit proposes water quality-based effluent limits (WQBELS) for several pollutants or parameters since EPA has determined, based on effluent data provided by the permittee and the nature of the discharge, that the effluent discharged from the facility causes, has the reasonable potential to cause, or contributes to an exceedance of GWQS. EPA has determined that effluent from the Umatac-Merizo WWTP, when discharged through Discharge Point No. 001, demonstrates reasonable potential to exceed water quality standards for orthophosphate, nitrate nitrogen, ammonia nitrogen, and total chlorine residual.

    WQBELs for water quality-limited pollutants can include consideration of background (ambient) pollutant concentrations, determined at the reference site.

Waste load allocations (WLAs) typically reduce the assimilative capacity of the receiving water by subtracting the contribution of background levels of pollution from the total allowed as determined from applicable water quality standards or criteria. However, the WLAs derived below did not include any consideration of background levels of pollutants in their derivation.

EPA recommends the use of a permit limit derivation procedure for WQBELs where the acute, chronic, and human health WLAs are statistically translated into effluent limitations based on the more stringent acute, chronic, or human health WLA (section 5.4.1 of EPA's TSD). As described in section 5.2.2 of EPA's TSD, WQBELs for NPDES dischargers are established based on the need to maintain effluent quality for a pollutant at a level that will comply with water quality standards even during critical conditions in the receiving water. This level is determined by the WLA for the particular pollutant. The WLA, in turn, dictates the necessary treatment performance level for the pollutant through the calculation of a long-term average (LTA) to ensure that the WLA is met under critical conditions over a long-term period.

In the draft permit, calculations of permit limitations are based on statistical procedures outlined in section 5.4.1 and 5.4.4 of EPA's TSD and are expressed as a Maximum Daily Limitation (MDL) or Average Monthly Limitation (AML). Mass-based MDLs and AMLs were calculated based on the design flow of 0.391 MGD. Attachment D provides an example of the permit limit derivation procedure for this discharge.

For all reissued permits, section 402(o) of the CWA and 40 CFR 122.44(l) require permit conditions to be as stringent as the existing permit unless specific exceptions apply. The draft permit contains no specific exceptions for WQBELs. The derivation of each WQBEL is described in sections 3.a. through 3.h. (including Tables 4 through 7). Table 8 provides a summary of all WQBELs, monitoring frequency, and sample types for each pollutant or parameter in the draft permit that demonstrated reasonable potential to cause, or contribute to an exceedance of GWQS.

a. Orthophosphate. Section 5103(C)(3)(a) of the GWQS provide that ortho-phosphate shall not exceed 0.10 mg/L (as P) in S-3 category surface waters. A summary of WQBEL calculations and final effluent limitations for ortho-phosphate are provided in Table 4. EPA proposes a MDL and AML of 0.16 mg/L and 0.08 mg/L, respectively, for orthophosphate. EPA also proposes a mass-based MDL and AML of 0.52 lbs/day and 0.26 lbs/day, respectively.

b. Nitrate-nitrogen. Section 5103(C)(3)(b) of the GWQS provide that nitrate-nitrogen shall not exceed 0.50 mg/L (as N) in S-3 category surface waters. A summary of WQBEL calculations and final effluent limitations for nitrate-nitrogen are provided in Table 5. EPA proposes a MDL and AML of 0.82 mg/L and 0.41 mg/L for nitrate nitrogen, as the MDL and AML, respectively. In addition, EPA proposes a mass-based MDL and AML of 2.67 and 1.33 lbs/day.

Table 4 - WQBEL Calculations for Orthophosphate.

	Chronic[1]
Water Quality Criterion, mg/L	0.10
No Dilution Credit Authorized	0
Background Concentration, mg/L	0
WLA, mg/L	0.10
WLA Multiplier (99^{th}%)	0.527
LTA, mg/L	0.0527
LTA_{MDL} Multiplier (99^{th}%)	3.11
MDL, mg/L	0.16
MDL, lbs/day	0.52
LTA_{AML} Multiplier (95^{th}%)[2]	1.55
AML, mg/L	0.08
AML, lbs/day	0.26

[1]Derivation of permit limit based on Section 5.4.1 of EPA's TSD
[2]LTA multiplier based on sampling frequency of four times per month per section 5.5.3 of EPA's TSD

Table 5 - WQBEL Calculations for Nitrate-nitrogen.

	Chronic[1]
Water Quality Criterion, mg/L	0.50
No Dilution Credit Authorized	0
Background Concentration, mg/L	0
WLA, mg/L	0.50
WLA Multiplier (99^{th}%)	0.527
LTA, mg/L	0.2635
LTA_{MDL} Multiplier (99^{th}%)	3.11
MDL, mg/L	0.82
MDL, lbs/day	2.67
LTA_{AML} Multiplier (95^{th}%)[2]	1.55
AML, mg/L	0.41
AML, lbs/day	1.33

[1]Derivation of permit limit based on Section 5.4.1 of EPA's TSD
[2]LTA multiplier based on sampling frequency of four times per month per section 5.5.3 of EPA's TSD

Table 6 - WQBEL Calculations for Ammonia Nitrogen.

	Acute	**Chronic**
Freshwater Aquatic Life Criteria, mg/L	2.01	0.37
No Dilution Credit Authorized	0	0
Background Concentration, mg/L	0	0
WLA, mg/L	2.01	0.37
WLA Multiplier (99^{th}%)	0.321	0.527
LTA, mg/L	0.645	0.195
LTA_{MDL} Multiplier (99^{th}%)	--	3.11
MDL, mg/L	--	0.61
MDL, lbs/day	--	1.99
LTA_{AML} Multiplier (95^{th}%)[1]	--	1.55
AML, mg/L	--	0.30
AML, lbs/day	--	0.98

[1]LTA multiplier based on sampling frequency of four times per month per section 5.5.3 of EPA's TSD

Table 7 - WQBEL Calculations for Total Chlorine Residual.

	Acute	**Chronic**
Freshwater Aquatic Life Criteria, ug/L	19	11
No Dilution Credit Authorized	0	0
Background Concentration, ug/L	0	0
WLA, ug/L	19	11
Coefficient of Variation	0.6	0.6
WLA Multiplier (99^{th}%)	0.321	0.527
LTA, ug/L	6.099	5.797
LTA_{MDL} Multiplier (99^{th}%)	--	3.11
MDL, ug/L	--	18
MDL, lbs/day	--	0.09
LTA_{AML} Multiplier (95^{th}%)[1]	--	1.55
AML, ug/L	--	9
AML, lbs/day	--	0.05

[1]LTA multiplier based on sampling frequency of four times per month per section 5.5.3 of EPA's TSD

c. Ammonia Nitrogen. Details of the WQBEL calculations and final effluent limitations for ammonia nitrogen are provided in Table 6. EPA calculated a CMC and CCC of 2.01 and 0.0.37 mg/L of ammonia nitrogen, respectively, based on the procedure specified in the GWQS:

CMC = { 0.4110 / [1 + 10^(7.204 - pH)] } + { 58.4 / [1 + 10^(pH - 7.204)] }

CCC = { 0.0858 / [1 + 10^(7.688 - pH)] } + { 3.70 / [1 + 10^(pH - 7.688)] }

EPA calculated acute and chronic aquatic toxicity-based limits. The more stringent of the two was the chronic aquatic toxicity-based WLA: 0.61 mg/L and

0.30 mg/L, as the MDL and AML, respectively. In addition, based on these acute limits, EPA proposes a mass-based MDL and AML of 1.99 and 0.98 lbs/day.

d. Total Chlorine Residual. The existing permit establishes numeric effluent limitations for total chlorine residual. The existing permit establishes an MDL and AML of 12 and 6.1 ug/L, respectively. The existing permit also establishes mass-based effluent limitations of 0.039 and 0.020 lbs/day for the MDL and AML, respectively. Section 5103(C)(11)(B)(i) of GWQS provides that Appendix A contains Table IV of additional (non-priority) toxic pollutants that apply to all waters of Guam. For freshwater, the maximum numeric limit for chlorine (total residual) is 11 ug/l. In addition, EPA's National Recommended Water Quality Criterion for Non-priority Pollutants for chlorine in freshwater is a CMC of 19 ug/l and a CCC of 11 ug/l. Details of the WQBEL calculations and final effluent limitations for total residual chlorine are provided in Table 7. EPA calculated concentration-based WQBELs of 18 and 9 ug/L, as the MDL and AML, respectively; and the mass-based WQBELs of 0.09 and 0.05 lbs/day for the MDL and AML, respectively. These limitations are calculated to be less stringent than the existing effluent limitations. Section 402(o)(2) of the CWA prohibits the establishment of less stringent effluent limitations in reissued NPDES permits except as allowed in 40 CFR 122.44(l)(2)(i). Therefore, EPA proposes to re-establish the existing effluent limitations for total residual chlorine. However, since the facility does not currently have the infrastructure necessary to disinfect using chlorine but may have the capability to do so during the permit term, effluent limits for total residual chlorine only become effective upon operation of a chlorination/dechlorination system.

e. Whole Effluent Toxicity. Section 5103 of GWQS provides narrative toxicity requirements that limit the adverse effects of toxic substances in effluents. The existing permit requires annual chronic toxicity testing using the water flea, *Ceriodaphnia dubia*. Due to the absence of toxicity test data to evaluate reasonable potential, there are no effluent limitations for toxicity proposed for the draft permit at this time. However, EPA proposes annual chronic toxicity monitoring with numeric chronic effluent triggers. For this discharge, the chronic WET permit triggers are any one test result greater than 1.6 TU_c (during the monthly reporting period), or any one or more test rests with a calculated median value greater than 1.0 TU_c (during the monthly reporting period).

f. E. coli. Section 5103(C)(1)(b) of GWQS provides that concentrations of E. coli for S-3 category waters shall be no greater than 126 CFU/100 mL based on five samples taken over a 30-day period, nor shall any instantaneous reading exceed 406 CFU/100 mL. To protect the beneficial uses of S-3 category waters, EPA proposes a MDL and AML of 406 CFU/100 mL and 126 CFU/100 mL, respectively, for E. coli in the draft permit.

4. Compliance with Federal Anti-Backsliding Provisions and Guam's Antidegradation Policy for Proposed WQBELS. Section 402(o) of the CWA prohibits the renewal or reissuance of an NPDES permit that contains WQBELs less stringent than those established in the previous permit, except as provided in the statute. This is referred to as "anti-backsliding." The permit proposes numeric

WQBELs that are sometimes higher for orthophosphate and nitrate nitrogen than those established in the existing permit. These effluent limitations may be relaxed, following section 402(o)(2)(b)(i) of the CWA, because they are based on new information not available at the time of permit reissuance that would have justified less stringent WQBELs (i.e., EPA's recommended limit derivation procedures applied for the first time to this discharge) and since the proposed more stringent numeric average monthly limits for these pollutants will necessitate an overall reduction in mass emission rates to Toguan River.

The establishment of less stringent water quality-based effluent limitations for the maximum daily limitation for orthophosphate and nitrate nitrogen is subject to the anti-degradation requirements set forth in EPA's antidegradation policy at 40 CFR 131.12 and Guam's antidegradation policy in section 5101 of GWQS. EPA believes that the proposed more stringent numeric average monthly limits for these pollutants will result in the discharge's overall compliance with water quality standards and federal and territorial antidegradation provisions.

PART V - DETERMINATION OF NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

Section 5103 of GWQS contains narrative water quality standards that apply to all waters of Guam. The draft permit establishes the following narrative water quality-based effluent limits:

A. The discharge shall be free from substances, conditions or combinations that cause visible floating materials, grease, oil, scum, foam, and other floating material which degrades water quality or use;

B. The discharge shall be free from substances, conditions or combinations that produce visible turbidity, settle to form deposits or otherwise adversely affect aquatic life;

C. The discharge shall be free from substances, conditions or combinations that produce objectionable color, odor or taste, directly or by chemical or biological action;

D. The discharge shall be free from substances, conditions or combinations that injure or are toxic or harmful to humans, animals, plants or aquatic life;

E. The discharge shall be free from substances, conditions or combinations that induce the growth of undesirable aquatic life;

F. The discharge shall not cause the temperature in the receiving water to deviate more than 1.0 degree Centigrade (1.8 of the degree Fahrenheit) from ambient conditions;

G. The discharge shall not cause the turbidity in the receiving water to exceed 1.0 NTU;

H. The discharge of any radioactive wastes and contaminated radioactive materials from research facilities is strictly prohibited;

Table 8 - Proposed Effluent Limitations and Monitoring, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Outfall No. 001 for the Umatac-Merizo WWTP.

Parameter	Units [1]	Existing Permit Effluent Limitations			Draft Permit Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Flow Rate	MGD	Monitoring Only	Monitoring Only	Monitoring Only	0.391	--[2]	--	Weekly	Measured
Biological Oxygen Demand (5-day)	mg/L	30	45	--	30	45	--	Weekly	8-hr Composite[3]
	lbs/day	98	150	--	98	147	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.								
pH	Standard Units	Not < 6.5 nor > 8.5 SU at any time.			Not < 6.5 nor > 8.5 SU at any time			Weekly	Discrete
Temperature	°C	--	Monitoring Only	--	--	--	Monitoring Only	Weekly	Discrete
Dissolved Oxygen	mg/L	--	Monitoring Only	--	--	--	--	Weekly	Discrete
Turbidity	NTU[4]	--	--	1.0	--	--	--	Weekly	Discrete
Total Suspended Solids	mg/L	30	40	--	30	45	--	Weekly	8-hr Composite
	lbs/day	98	130	--	98	147	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.								
Oil and Grease	mg/L	Monitoring Only	--	Monitoring Only	10	--	15	Annually	Grab
	lbs/day	Monitoring Only	--	Monitoring Only	33	--	49		

Table 8 Continued - Proposed Effluent Limitations and Monitoring, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Outfall No. 001 for the Umatac-Merizo WWTP.

Parameter	Units [1]	Existing Permit Effluent Limitations			Draft Permit Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Fecal Coliform	CFU/ 100 mL	--	--	--	200	400	--	Weekly	Discrete
E. coli	CFU/ 100 mL	126	--	406	126	-	406	Weekly	Discrete
Enterococci	CFU/ 100 mL	Monitoring Only	--	Monitoring Only	Monitoring Only	-	Monitoring Only	Weekly	Discrete
Orthophosphate	mg/L	Monitoring Only	--	0.10	0.08	--	0.16	Weekly	8-hr Composite
	lbs/day	Monitoring Only	--	0.33	0.26	--	0.52		
Nitrate-nitrogen	mg/L	Monitoring Only	--	0.50	0.41	--	0.82	Weekly	8-hr Composite
	lbs/day	Monitoring Only	--	2.16	1.33	--	2.67		
Ammonia Nitrogen	mg/L	Monitoring Only	--	Monitoring Only	0.31	--	0.61	Weekly	8-hr Composite
	lbs/day	Monitoring Only	--	Monitoring Only	0.98	--	1.99		
Total Chlorine Residual[5]	ug/L	6.1	--	12	6.1	--	12	Weekly	Discrete
	lbs/day	0.020	--	0.039	0.020	--	0.039		
Total Kjedahl Nitrogen	mg/L	Monitoring Only	--	Monitoring Only	--	--	--	Weekly	8-hr Composite
	lbs/day	Monitoring Only	--	Monitoring Only	--	--	--		
Hardness, as $CaCO_3$	mg/L	Monitoring Only	--	Monitoring Only	--	--	Monitoring Only	Annually	8-hr Composite

Table 8 Continued - Proposed Effluent Limitations and Monitoring, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Outfall No. 001 for the Umatac-Merizo WWTP.

Parameter	Units [1]	Existing Permit Effluent Limitations			Draft Permit Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Heavy Metals[6]	ug/L or mg/L	Monitoring Only	--	Monitoring Only	--	--	Monitoring Only	1x/Permit Term	8-hr Composite
Pesticides[7]	ug/L or mg/L	Monitoring Only	--	Monitoring Only	--	--	Monitoring Only	1x/Permit Term	8-hr Composite
Whole Effluent Toxicity	TU_c	Monitoring Only	--	Monitoring Only	Monitoring Only	--	Monitoring Only	Annually	8-hr Composite

[1] Mass effluent limitations based on a design flow of 0.391 MGD
[2] Not applicable
[3] 8-hr composite sampling based on the operation of the facility 8 hours per day
[4] Nephelometric units
[5] Total Residual Chlorine effluent limitation and effluent monitoring requirement is effective upon implementation of a disinfection system using chlorination; the permittee is required to notify EPA and GEPA 30 days prior to operation of a disinfection system
[6] Heavy metals mean: As, Cd, Cr^{3+}, Cr^{6+}, Cu, Hg, Pb, Ni, Ag, and Zn; both total recoverable and dissolved metal concentrations shall be reported; monitoring of heavy metals is part of the Priority Toxic Pollutants Scan required to be conducted on the fourth year of the permit term
[7] For a listing of all pesticides (organochlorines, organophosphates, carbamates, herbicides, fungicides, defoliants, and botanicals) see EPA Water Quality Criteria *Blue Book;* monitoring of pesticides is part of the Priority Toxic Pollutants Scan required to be conducted on the fourth year of the permit term

I. The discharge shall not cause the concentration of suspended matters at any point be increased more than 25 percent from ambient at any time, and the total concentration should not exceed 40 mg/l, except when due to natural conditions;

J. The discharge shall not cause the concentration of DO in the receiving water to be less than 75% of saturation; and

K. The discharge shall not cause the pH in the receiving water to exceed the range of 6.5 to 9.0 standard units.

PART VI - MONITORING AND REPORTING REQUIREMENTS

The draft permit requires the permittee to continue to monitor for pollutants or parameters in the effluent with technology-based effluent limits and water quality-based effluent limits for the duration of the permit term.

A. Influent Monitoring and Reporting

The permittee shall conduct influent monitoring of BOD and TSS to evaluate compliance with the draft permit conditions. The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the draft permit. All influent monitoring data shall be reported on monthly DMR forms and submitted quarterly to EPA and GEPA, as specified in the draft permit.

B. Effluent Monitoring and Reporting

The permittee shall conduct effluent monitoring to evaluate compliance with the draft permit conditions. The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the draft permit. All effluent monitoring data shall be reported on monthly DMR forms and submitted quarterly to EPA and GEPA, as specified in the draft permit.

C. Whole Effluent Toxicity Monitoring and Reporting

For compliance with narrative GWQS for toxicity, the draft permit requires the permittee to conduct whole effluent toxicity monitoring to determine whether the effluent is contributing chronic toxicity to the receiving water. The draft permit also requires that if effluent toxicity is observed, the permittee must investigate the causes of, and identify corrective actions to reduce or eliminate any observed effluent toxicity.

Monitoring Frequency. The permittee shall conduct annual chronic toxicity tests on 24-hour composite effluent samples. The permittee shall continue to conduct routine annual toxicity testing using the same test organism as is required under the existing permit, *Ceriodaphnia dubia*. The chronic toxicity test sample shall be collected at the designated NPDES sampling station for the effluent, i.e., downstream from the last treatment process and any in-plant return flows where a representative effluent sample can be obtained. During each year of the permit term, a split of one toxicity test sample shall be analyzed for all other monitored parameters at the minimum frequency of analysis specified by the effluent monitoring program.

Freshwater Species and Test Methods. Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the fourth edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136). The permittee shall conduct static renewal toxicity tests with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.01).

Toxicity Triggers. There are no chronic toxicity effluent limits for this discharge. Instead, EPA proposes numeric effluent triggers. For this discharge, a mixing zone or dilution allowance is not authorized for chronic toxicity and the chronic WET permit effluent triggers are any one test result greater than 1.6 TU_c (during the monthly reporting period), and any one or more test results with a calculated median value greater than 1.0 TU_c (during the monthly reporting period). Results shall be reported in TU_c, where TU_c = 100/NOEC (No Observed Effect Concentration, is the highest concentration of toxicant to which organisms are exposed that causes no observable adverse effects on the test organisms). The draft permit requires additional toxicity testing if a chronic WET permit effluent trigger is exceeded.

Chronic Toxicity Reporting and Quality Assurance. All toxicity monitoring data shall be reported on monthly DMR forms and submitted with Quality assurance measures, instructions, and other recommendations and requirements are found in the test methods manual previously referenced. Additional requirements that address dilution and control water quality, reference toxicant testing, test results review and reporting, within-test variability, chlorinated effluents, and ammonia/pH drift are included in the draft permit.

D. Priority Toxic Pollutants Scan

In accordance with federal regulations, the permittee shall conduct Priority Toxics Pollutants scans during the fourth year of the five-year permit term to ensure that the discharge does not contain toxic pollutants in concentrations that may cause a violation of water quality standards. The permittee shall perform all effluent sampling and analyses for the priority pollutants scan in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the draft permit or EPA. 40 CFR 131.36 provides a complete list of Priority Toxic Pollutants.

PART VII - STANDARD CONDITIONS

A. Reopener Provisions

1. In accordance with 40 CFR 122 and 124, the permit may be modified by EPA to include effluent limits, monitoring, or other conditions to implement new regulations, including EPA-approved water quality standards; or to address new information indicating reasonable potential for the discharge to cause or contribute to exceedances of water quality standards.
2. In accordance with 40 CFR and Parts 122 and 124, the draft permit may be modified to include effluent limitations or permit conditions to address chronic toxicity in the effluent or receiving water body, as a result of the discharge; or implement new, revised, or newly interpreted water quality standards applicable to chronic toxicity.

B. Standard Provisions

The draft permit requires the permittee to comply with EPA Region IX Standard Federal NPDES Permit Conditions, dated July 1, 2001.

PART VIII - SPECIAL CONDITIONS

A. Development and Implementation of Best Management Practices

The draft permit requires the permittee to develop and implement appropriate pollution prevention measures or Best Management Practices (BMPs) designed to control site runoff, spillage or leaks, sludge or waste disposal, and drainage from collection system, storage/supply, and treatment/operational/process areas that may contribute pollutants to surface waters within 90 days from the effective date of the permit (section 304(e) of the CWA and 40 CFR 122.44(k)). BMPs shall include but are not limited to those necessary to control TSS and oil and grease. Through the implementation of BMPs described in a BMP Plan, the permittee shall prevent or minimize the generation and discharge of wastes and pollutants from the facility to waters of the U.S. The BMP plan shall be located at the facility and be made available upon request by EPA and/or GEPA.

B. Constructed Wetlands Waste Water Treatment System Operations and Maintenance Plan

The draft permit requires the permittee to submit a Wetlands Waste Water Treatment System Operations and Maintenance Plan (the Plan) for the Wetlands Treatment System (WTS). The Plan shall include a description of all appropriate physical and biological measures necessary to efficiently manage the WTS based on site monitoring results and design considerations. The Plan shall include consideration of pretreatment (i.e., prior to wetland polishing), vegetation, soil (including a soils monitoring plan designed to assess toxic accumulation of metals, nutrients, and oil and grease in each cell of the constructed wetland waste water treatment system), and hydrologic management as determined by the final system design. The Plan shall be submitted to GEPA and EPA within 90 days of the effective date of the final permit. The Plan shall be updated annually to account for seasonal variations, wetland physiologic development, and other factors.

C. Development and Implementation of the Toguan River Receiving Water Monitoring Program

Monitoring Requirements. The draft permit requires the permittee to develop and implement a Toguan River receiving water monitoring program. Surface water monitoring is required to determine compliance with narrative water quality-based effluent limitations and to characterize the general quality of the receiving water. Monitoring requirements and frequencies have been retained from the existing permit. The existing permit established receiving water monitoring at the surface water stations whose locations are described in Table 9 and are mapped in Attachment D, and which are retained in the draft permit.

The rationale for retaining the receiving water monitoring program in the draft permit is based on ability of this facility to discharge effluent to the Toguan River and performance

of the Umatac-Merizo WWTP from 2002 to 2007:

- E. coli and enteroccoci levels were noncompliant for all reported discharges, typically one to two orders of magnitude above permit limits because disinfection is not performed on the effluent;
- Maximum daily levels of orthophosphate are consistently out of compliance with permit limits, generally three- to seven-fold above permit limits; and
- Turbidity is consistently far (10- to 30-fold) above permit limits.

Also, the Guam Water Resource Master Plan concludes that for the Umatac-Merizo treatment plant, water quality standards for nutrients are "…impossible to achieve with the existing facility."

The monitoring requirements of the receiving water monitoring program that are in the existing permit are retained in the draft permit and provided in Table 10.

Monitoring Frequency. The draft permit requires the permittee to submit quarterly receiving water monitoring reports to EPA and GEPA by 28th of April, July, October, and January for each period covering the previous three calendar months. At a minimum, these reports shall include:

1. A description of all station locations with verified latitude and longitude coordinates submitted with the first quarterly receiving water report.

2. A description of climatic and receiving water characteristics at the time of sampling (*e.g.*, weather observations, floating debris, discoloration, time of sampling, tide, *etc.*);

3. A description of the sample collection and preservation procedures used in the receiving water monitoring program;

4. Description of the specific method used for laboratory analysis; and

5. An in-depth discussion of the results of the receiving water monitoring program.

Table 9 - Description of Surface Water Monitoring Station Locations on the Toguan River.

Station Name	Location
TR1 - Toguan River Station 1 (control)	200 feet upstream of Discharge Serial No. 001
TR2 -Toguan River Station 2	100 feet downstream of Discharge Serial No. 001

Table 10 - Summary of Surface Water Monitoring Requirements for the Umatac-Merizo WWTP.

Receiving Water Characteristic	Units	Station	Monitoring Frequency	Sample Type
Surface Flow	cfs	TR1	Monthly	Measured
E. coli	CFU/100 mL	TR1, TR2	Monthly	Grab
pH	Standard Units	TR1, TR2	Monthly	Grab
Orthophosphate (PO_4-P)	mg/L	TR1, TR2	Monthly	Grab
Nitrate-Nitrogen (NO_3-N)	mg/L	TR1, TR2	Monthly	Grab
Dissolved Oxygen	mg/L	TR1, TR2	Monthly	Grab
Turbidity	NTU	TR1, TR2	Monthly	Grab
Temperature	^oC	TR1, TR2	Monthly	Grab

D. Development of an Initial Investigation TRE Workplan

The draft permit requires the permittee to develop and implement, in the event effluent toxicity is triggered, a Toxics Reduction Evaluation (TRE) Workplan. For chronic toxicity, unacceptable effluent toxicity is found in a single test result greater than 1.0 TU_c. The draft permit also requires additional toxicity testing if a chronic toxicity monitoring trigger is exceeded.

Within 90 days of the permit effective date, the permittee shall prepare and submit a copy of their Initial Investigation TRE Workplan (1-2 pages) to the permitting authority for review. This plan shall include steps the permittee intends to follow if toxicity is measured above a chronic WET permit limit or trigger and should include, at minimum:

1. A description of the investigation and evaluation techniques that would be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency;
2. A description of methods for maximizing in-house treatment system efficiency, good housekeeping practices, and a list of all chemicals used in operations at the facility; and
3. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who would conduct the TIEs (i.e., an in-house expert or outside contractor).

E. Accelerated Toxicity Testing and TRE/TIE Process

1. If a chronic WET permit limit or trigger is exceeded and the source of toxicity is known (e.g., a temporary plant upset), then the permittee shall conduct one additional toxicity test using the same species and test method. This test shall begin within 14 days of receipt of test results exceeding a chronic WET permit limit or trigger. If the

additional toxicity test does not exceed a chronic WET permit limit or trigger, then the permittee may return to their regular testing frequency.

2. If a chronic WET permit limit or trigger is exceeded and the source of toxicity is not known, then the permittee shall conduct six additional toxicity tests using the same species and test method, approximately every two weeks, over a 12 week period. This testing shall begin within 14 days of receipt of test results exceeding a chronic WET permit limit or trigger. If none of the additional toxicity tests exceed a chronic WET permit limit or trigger, then the permittee may return to their regular testing frequency.

3. If one of the additional toxicity tests (in paragraphs G.1 or G.2) exceeds a chronic WET permit limit or trigger, then, within 14 days of receipt of this test result, the permittee shall initiate a TRE using as guidance, based on the type of treatment facility, EPA manuals *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants* (EPA/ 833/B-99/002, 1999) or *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA/600/2-88/070, 1989). In conjunction, the permittee shall develop and implement a detailed TRE workplan which shall include: further actions undertaken by the permittee to investigate, identify, and correct the causes of toxicity; actions the permittee will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and a schedule for these actions.

4. The permittee may initiate a Toxicity Identification Evaluation (TIE) as part of a TRE to identify the causes of toxicity using the same species and test method and, as guidance, EPA test method manuals: *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I* (EPA/600/6-91/005F, 1992); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993a); and *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993b).

PART IX - SLUDGE/BIOSOLIDS LIMITATIONS AND MONITORING REQUIREMENTS

A. Pursuant to 40 CFR 503, standard requirements for the monitoring, reporting, recordkeeping, and handling of biosolids are proposed for the draft permit. “Biosolids” means non-hazardous sewage sludge, as defined in 40 CFR 503.9. Sewage sludge that is hazardous, as defined in 40 CFR 261, must be disposed of in accordance with the Resource Conservation and Recovery Act. Biosolids permit provisions address: General Requirements, Inspection and Entry, Monitoring, Pathogen and Vector Control, Surface Disposal, Landfill Disposal, and Notification and Reporting.

PART X - OTHER CONSIDERATIONS UNDER FEDERAL LAW

A. Impact to Threatened and Endangered Species

Section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1536) requires federal agencies to ensure that any action authorized, funded, or carried out by the federal agency does not jeopardize the continued existence of a listed or candidate species, or result in

the destruction or adverse modification of its habitat. The Toguan River is considered a tributary that is generally used for commercial, agricultural, and industrial activities and limited body contact recreation. On May 6, 2008, EPA requested informal consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service (collectively referred to as "the Services") to identify any federally listed, proposed and candidate endangered or threatened species and designated and proposed critical habitats that occur in the Toguan River or in the vicinity of the effluent discharge. On May 22, 2008, the National Marine Fisheries Service indicated that there are no marine ESA-listed species under their jurisdiction that occur in waters or shorelines in the vicinity of the effluent discharged to the Toguan River. However, the National Marine Fisheries Service provided a list of endangered and threatened species under their jurisdiction that occur beyond where the Toguan River flows into Toguan Bay and into the Philippine Sea surrounding the Island of Guam. Table 11 provides a list of ESA-listed species subject to the jurisdiction of the Services.

Table 11 - List of endangered or threatened species under jurisdiction of the National Marine Fisheries Service that occur in marine waters surrounding Guam.

ESA Endangered or Threatened Species	Use
Demochelys coriacea (Leatherback Turtle)	Swimming/Feeding
Eretmochelys imbricate (Hawskbill Turtle)	Swimming/Feeding
Chelonia mydas (Green Turtle)	Swimming/Feeding
Lepidochelys olivacea (Olive Ridley Turtle)	Swimming/Feeding
Megaptera novaeangliae (Humpback Whale)	Swimming/Feeding
Physeter macrocephalus (Sperm Whale)	Swimming/Feeding
Balaenoptera musculus (Blue Whale)	Swimming/Feeding
Balaenoptera physalus (Fin Whale)	Swimming/Feeding
Balaenoptera borealis (Sei Whale)	Swimming/Feeding

On May 22, 2008, the U.S. Fish and Wildlife Service indicated that the endangered Mariana common moorhen (*Gallinula chloropus guami*) is known to use wetland and river habitats in the Toguan River and bay area. The endangered hawksbill sea turtle (*Eretmochelys imbricate*) and threatened green sea turtle (*Chelonia mydas*) have been documented to use beaches north of Umatac, and both sea turtles may nest or forage in the Toguan Bay area as well.

The effluent discharged from this facility is characterized as secondary-treated sanitary wastewater. The permittee is considered a minor discharger that discharges less than 1.0 MGD into the Toguan River approximately 1,100 feet upstream of the Toguan Bay estuary. There are no known industrial discharges to the treatment plant.

EPA will be informally consulting with the U.S. Fish and Wildlife Service to determine whether the proposed effluent limitations and permit conditions are likely to affect the availability or distribution of prey species or produce undesirable aquatic life within the Toguan River that may directly impact threatened or endangered species. EPA will provide the Services with copies of this fact sheet and the draft permit during the public notice period. Any comments received from the Services regarding this determination will be considered prior to issuance of the final permit.

B. Impact to Coastal Zones

The Coastal Zone Management Act (CZMA) requires that Federal activities and licenses, including Federally permitted activities, must be consistent with an approved state Coastal Management Plan (CZMA Sections 307(c)(1) through (3)). Section 307(c) of the CZMA and implementing regulations at 40 CFR 930 prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State (or Territory) Coastal Zone Management program, and the State (or Territory) or its designated agency concurs with the certification. At this time, EPA has not received a consistency certification from the Guam Department of Commerce for the proposed Umatac-Merizo WWTP discharge. At the time the certification is received, EPA will review the certification and will make any necessary modification to the draft permit to ensure compliance with the Guam Coastal Management Plan.

C. Impact to Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act (MSA) set forth a number of new mandates for the National Marine Fisheries Service, regional fishery management councils and other federal agencies to identify and protect important marine and anadromous fish species and habitat. The MSA requires Federal agencies to make a determination on Federal actions that may adversely impact Essential Fish Habitat (EFH) in marine environments. Since the Toguan River is considered a freshwater ecosystem, federal requirements of the MSA do not apply to EPA's proposed action to issue an NPDES permit to discharge in the Toguan River. Therefore, EPA is not required to make a determination on whether this action may adversely impact Essential Fish Habitat, as defined under the MSA.

D. Impact to National Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effect of their undertakings on historic properties either listed on, or eligible for listing on, the National Register of Historic Places. Pursuant to federal requirements of NHPA and 36 CFR 800.3(a)(1), EPA has determined that the draft permit does not have the potential to affect any historic or cultural properties.

PART XI - ADMINISTRATIVE INFORMATION

A. Public Notice

In accordance with 40 CFR 124.10, the EPA Director shall give public notice that a proposed permit has been prepared under 40 CFR 124.6(d) by mailing a copy of the notice to the permit applicant and other federal and state agencies, and through publication of a notice in a daily or weekly newspaper within the area affected by the facility. The public notice shall allow at least 30 days for public comment on the proposed permit.

B. Public Comment Period

In accordance with 40 CFR 124.11 and 12, during the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. In accordance with 40 CFR 124.13, all persons must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period.

Comments may be submitted either in person or mailed to:

Douglas Eberhardt
EPA Region IX
NPDES Permits Office, WTR-5
75 Hawthorne Street
San Francisco, California 94105

Lorilee Chrisostomo
Guam EPA
P.O. Box 22439 GMF
Barrigada, GU 96921

Interested persons may obtain further information, including copies of the permit application, fact sheet, and draft permit, by contacting Mr. Douglas Eberhardt at the EPA address listed above. Copies of the Administrative Record (other than those which EPA maintains as confidential) are available for public inspection between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday (excluding federal holidays).

C. Public Hearing

In accordance with 40 CFR 124.12, the EPA Director shall hold a public hearing whenever she finds, on the basis of requests, a significant degree of public interest in the draft permit. The Director may also hold a public hearing when, for instance, such a hearing might clarify one or more issues involved in the permit decision. Public notice of such hearing shall be given as specified in 40 CFR 124.10.

D. Territorial Certification

In accordance with 40 CFR 124.53, under section 401 of the CWA, EPA may not issue a permit until certification is granted or waived in accordance with that section by the State or Territory in which the discharge originates. Territorial certification under section 401 of the CWA shall be in writing and shall include the conditions necessary to assure compliance with referenced applicable provisions of sections 208(e), 301, 302, 303, 306, and 307 of the CWA and appropriate requirements of Territory law. At this time, EPA has not received a section 401 certification from GEPA that the permittee's discharge is

consistent with the protected uses of the Toguan River, as stated in the GWQS and the CWA. At the time the certification is received, EPA will review the certification and will make any necessary modification to the draft permit to ensure compliance with the GWQS.

PART XII - REFERENCES

EPA. 1989. Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations. EPA/600/2-88/070.

EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water Enforcement and Permits, EPA. EPA/505/2-90-001.

EPA. 1992. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. EPA/600/6-91/005F.

EPA. 1993a. Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA/600/R-92/080.

EPA. 1993b. Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA/600/R-92/081.

EPA. 1999. Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants (EPA/ 833/B-99/002)

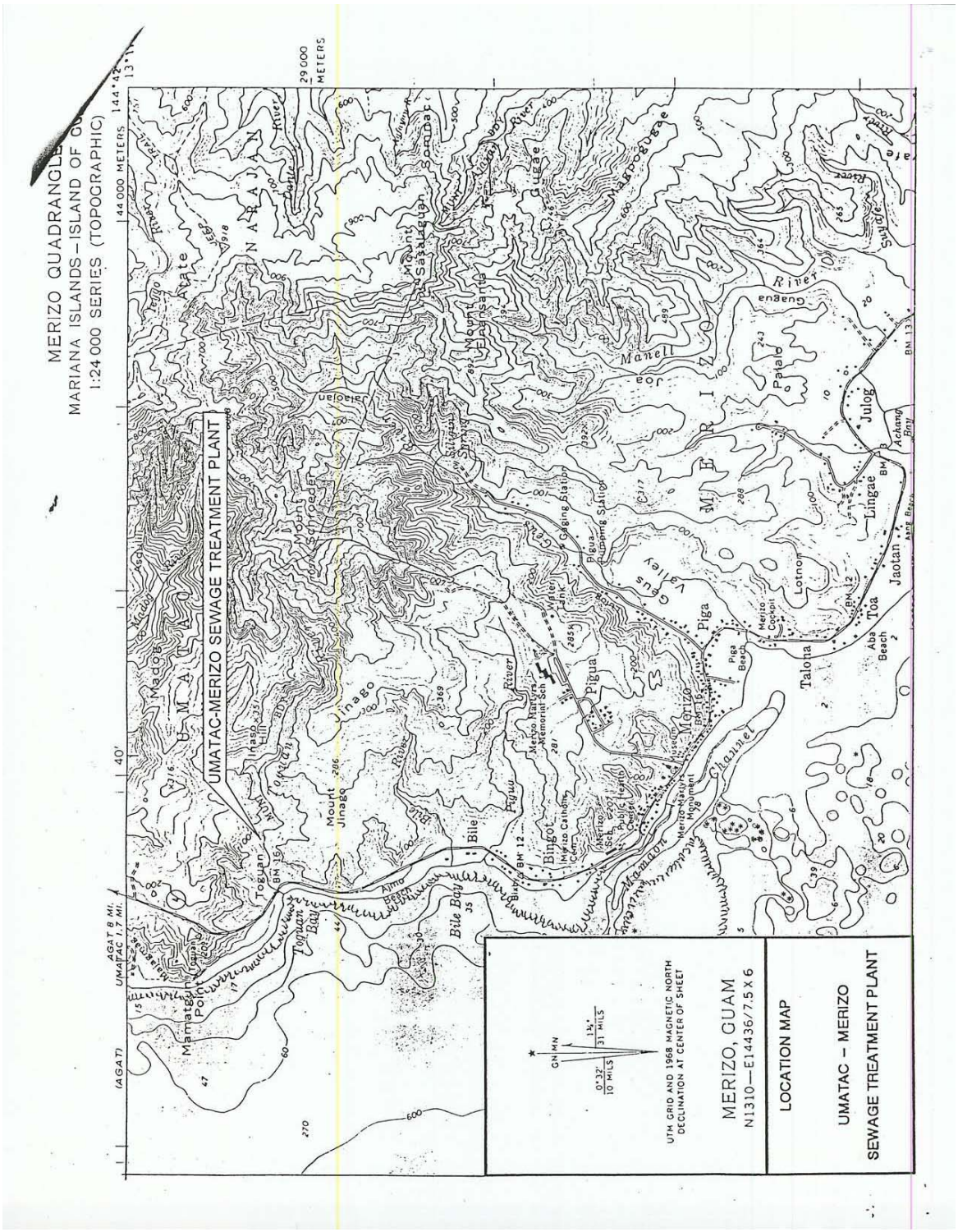
EPA. 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms. Office of Water, EPA. EPA/821/R-02/013.

GEPA. 2002. Guam Water Quality Standards 2001 Revision.

PART XIII - ATTACHMENTS

ATTACHMENT A

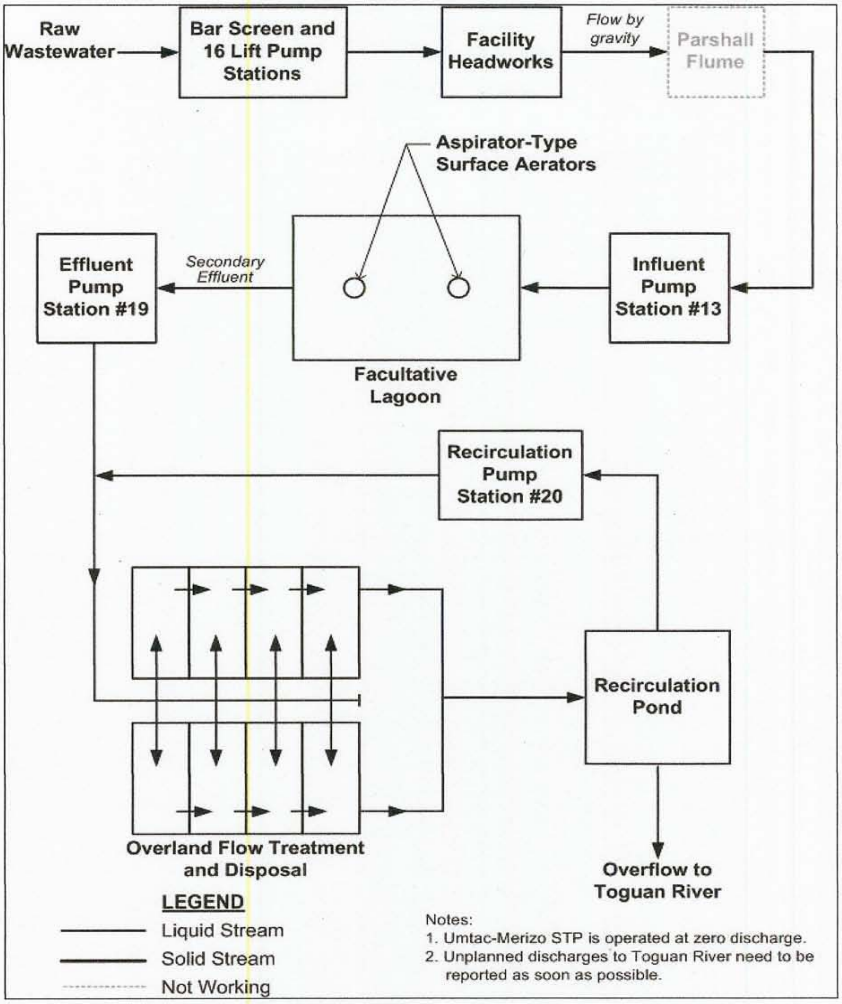
Location of the Umatac-Merizo WWTP on Guam



ATTACHMENT B

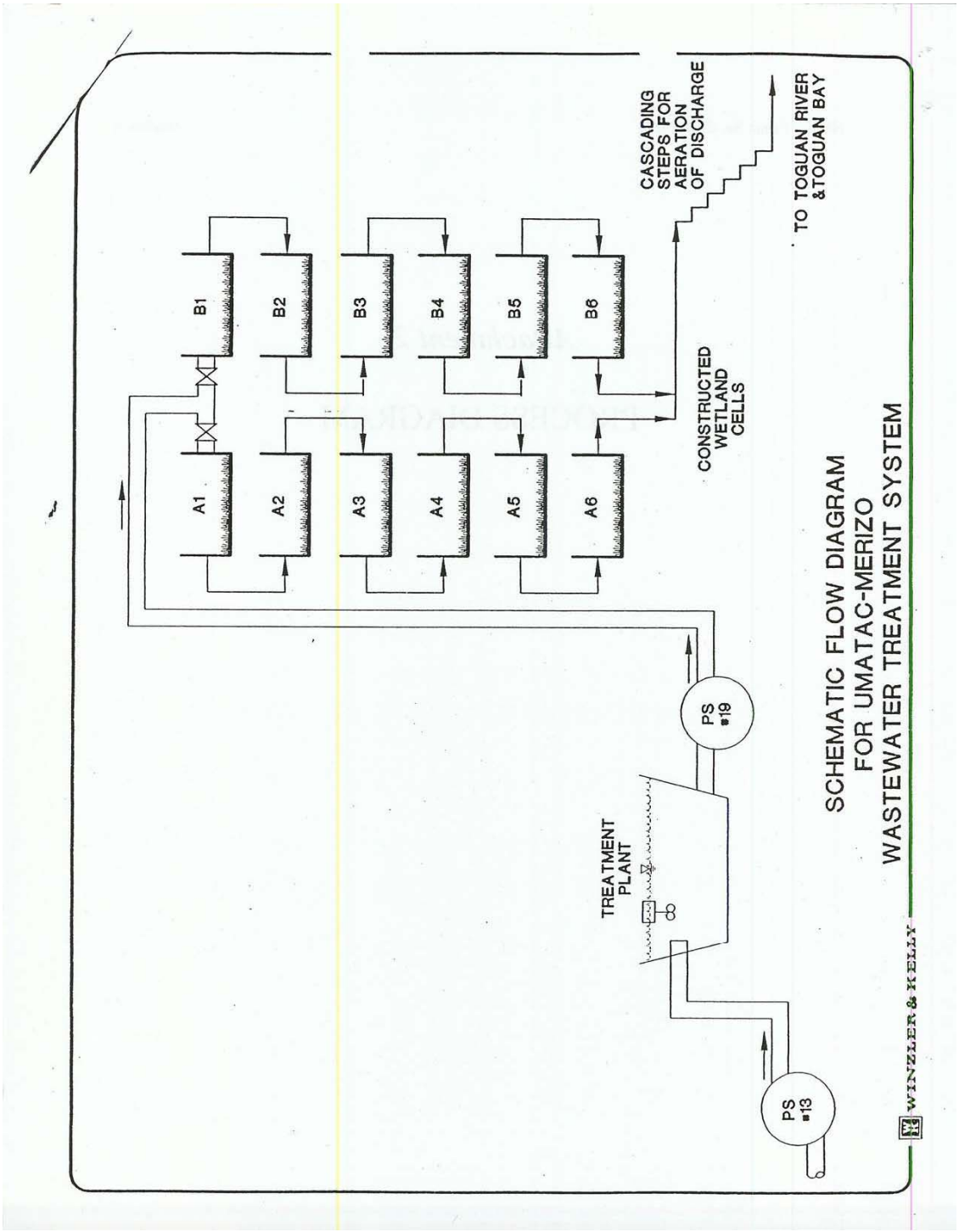
Umatac-Merizo Wastewater Treatment Process Flow

Figure 5-48 – Umatac-Merizo STP Schematic Flow Diagram



ATTACHMENT C

Wastewater Flow Diagram for the Umatac-Merizo WWTP Facility.



ATTACHMENT D

Calculations for Water Quality-Based Effluent Limitations

In accordance with EPA's Technical Support Document for Water Quality-Based Toxics Control ("TSD"), EPA calculated water quality-based effluent limitations for the draft permit using the following statistical procedures. Using ammonia nitrogen as an example, the following demonstrates the procedure for developing water quality-based effluent limitations for NPDES permits.

Step 1: For each constituent requiring an effluent limit, identify the applicable water quality criteria. For each criterion, determine the effluent concentration or waste load allocation (WLA) using the following steady state equation:

$$WLA = C + D(C-C_a)$$

Where: C = Applicable water quality criterion

D = Dilution Ratio

C_a = Ambient Background Concentration

For copper, the applicable water quality criteria for the protection of aquatic life in saltwater and other parameters include the following,

C_{acute} = 2.01 mg/L

$C_{chronic}$ = 0.37 mg/L

D = 0

C_a = 0

Based on the equation above, the WLAs for both acute and chronic are 2.01 and 0.37 mg/L, respectively.

Step 2: For each WLA based on aquatic life criterion, determine the long-term average discharge condition (LTA) by multiplying the WLA by a WLA multiplier. The multiplier is a statistically-based factor that adjusts the WLA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion. Table 5-1 of EPA's TSD provides pre-calculated WLA multipliers based on the value of the CV and the probability basis (i.e., the 95th or 99th percentile level). As specified in the TSD, a CV of 0.6 is typical of the range of variability of effluents measured by EPA and represents a reasonable degree of relative variability. Therefore, EPA recommends a CV of 0.6 and the 99th percentile when data sets are limited.

$$LTA_{acute} = WLA_{acute} \times \text{WLA multiplier}_{acute}$$

$$LTA_{chronic} = WLA_{chronic} \times \text{WLA multiplier}_{chronic}$$

For ammonia nitrogen, the following information was used to develop the LTA_{acute} and $LTA_{chronic}$ using Table 5-1 of the TSD.

WLA_{acute} = 2.01 mg/L

$WLA_{chronic}$ = 0.37 mg/L

WLA $multiplier_{acute}$ = 0.321

WLA $multiplier_{chronic}$ = 0.527

Thus,

$$LTA_{acute} = 2.01 \times 0.321 = 0.645 \text{ mg/L}$$

$$LTA_{chronic} = 0.37 \times 0.527 = 0.195 \text{ mg/L}.$$

Step 3: Select the most limiting (lowest) LTA. For ammonia nitrogen, the most limiting LTA was the $LTA_{chronic}$.

Step 4. Calculate the water quality based effluent limits by multiplying the LTA by an AML and MDL multiplier. Water quality based effluent limits are expressed an Average Monthly Limit (AML) and Maximum Daily Limit (MDL). The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedances frequencies of the criteria and the effluent limitation. The value of the multiplier varies depending on the probability, the CV, and the number of samples (AML only). Table 5-2 of the TSD provides pre-calculated AML and MDL multipliers.

$$AML = LTA_{chronic} \times \text{AML multiplier}$$

$$MDL = LTA_{chronic} \times \text{MDL multiplier}$$

For limited data, the TSD recommends the 95th percentile and 99th occurrence probability for the AML and MDL multipliers, respectively. For ammonia nitrogen, the following information was used to develop the AML and MDL for aquatic life using Table 5-2 of the TSD.

$$AML = 0.195 \times 1.55 = 0.30 \text{ mg/L}$$

$$MDL = 0.195 \times 3.11 = 0.61 \text{ mg/l}$$

Step 6: For mass-based limitations for ammonia nitrogen, calculate the mass limit based on the AML and MDL using a design flow rate of 0.391 MGD and a standard conversion factor.

$$AML_{mass} = 0.30 \text{ mg/L} \times 0.391 \text{ MGD} \times 8.34 \text{ lbs/MG/mg/L} = 0.99 \text{ lbs/day}$$

$$MDL_{mass} = 0.61 \text{ mg/L} \times 0.391 \text{ MGD} \times 8.34 \text{ lbs/MG/mg/L} = 1.99 \text{ lbs/day}$$

Thus,

$$AML_{mass} = 0.99 \text{ lbs/day}$$

$$MDL_{mass} = 1.99 \text{ lbs/day}$$

ATTACHMENT E

Description of Toguan River Monitoring Program